LA-UR-13-22538
Approved for public release; distribution is unlimited.

Title: Flux Effects on Helium Accumulation in Tungsten

Author(s): Sandoval Andrade, Luis A.
Perez, Danny
Uberuaga, Blas P.
Voter, Arthur F.

Intended for: 55th Annual Meeting of the APS Division of Plasma Physics, 2013-11-11/2013-11-15 (Denver, Colorado, United States)
Report
Web

Issued: 2013-07-16 (Rev.3) (Draft)

Flux effects on helium accumulation in tungsten

Luis Sandoval, Danny Perez, Blas P. Uberuaga and Arthur F. Voter
Theoretical Division T-1, Los Alamos National Laboratory, Los Alamos, NM 87505, USA

The growth process of helium bubbles in tungsten under flux rates spanning five orders of magnitude was investigated using direct molecular dynamics and parallel replica dynamics. We show clear differences in the evolution of bubbles as a function of the growth rate; in particular, we show that the critical size before bursting is overestimated at the high flux accessible to standard molecular dynamics simulations. These results have deep implications for multiscale and continuous modeling of plasma-facing materials under operating conditions.